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ABSTRACT

The term "conative" is used to describe constructs that span both motivational and volitional aspects of human behavior, distinguished from constructs that emphasize cognition and affection. Among the conative constructs are achievement strivings, beliefs about self-esteem and self-efficacy, interests and attitudes about learning, volitional aspects, and constructs related to self-regulation and mindfulness. This pilot research project was conducted to gain familiarity with various instruments used to measure conative constructs and to gain preliminary understanding of interrelationships among the conative constructs measured by the instruments. Sixty college students completed measures of approaches to learning and studying, mindfulness, action versus state orientation, and mastery versus performance orientation. On the whole, these measures demonstrated reasonably good psychometric properties and represented a good preliminary approach to research on the conative constructs. Of particular interest was the high correlation between mindfulness and the deep approach. (Contains 24 references.) (SLD)

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Project 2.3 Complex Performance Assessments: Expanding the Scope and Approaches to Assessment

Defining Conative Construct

The Exploration of a Selection of Conative Constructs Relevant to Learning and Performance

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THE EXPLORATION OF A SELECTION OF CONATIVE CONSTRUCTS RELEVANT TO LEARNING AND PERFORMANCE

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Introduction

Apart from conventional constructs of cognitive ability, there are substantial numbers of conative constructs that have been identified as important to learning from instruction. The term "conative" is used here to encompass this diverse set that spans both motivational and volitional aspects of human behavior, but also to distinguish it from the other important sets of constructs that emphasize cognition and affection. Among the conative constructs we include here are: achievement strivings, including need for achievement and fear of failure; beliefs about self-esteem and self-efficacy; interests and attitudes concerning learning in particular subject matter areas; volitional aspects of persistence, academic work ethic, will to learn, mental effort investment, and mindfulness in learning; intentional constructs reflecting self-regulation of actions leading toward desired goals; orientations toward the future, and an awareness of proximal and distal goals and their consequences; and numerous learning styles and strategies hypothesized to influence cognitive processes and outcomes of instruction. More traditional personality and style constructs, including field dependence, conscientiousness, extroversion, and independence, could also be included in this set. All of these constructs may be important to understanding student commitment to learning and studying, but it remains unclear which ones are most important.

Many of these constructs are measured by questionnaires, often hastily developed, that possess unknown psychometric properties. Furthermore, the studies that include them are often small-scale and do not include measures of other constructs with which they may overlap substantially. Likewise, some constructs appear to be defined and described in similar ways, yet are measured differently, leading to differences in empirical results (e.g.,

Spangler, 1992). What is needed, then, is a program of construct validational research to determine what theoretical and practical distinctions and what kinds of measurement will be most helpful to improving instructional research and evaluation.

Research Questions

This pilot research is first in a series of studies planned to improve our understanding of these conative educational processes and outcomes. The purpose of this study was twofold. The first aim was to gain a familiarity with the instruments used to measure a selection of conative constructs. For later studies, it is important to know how long each measure will take to administer, the psychometric properties of each questionnaire, and how students felt about the questionnaires in general. The second aim of this study was to obtain a preliminary understanding of the interrelationships among the various conative constructs measured by the questionnaires.

Descriptions of Selected Conative Constructs

Approaches to Learning and Studying

According to Marton and Säljö (1976) and Entwistle (1981, 1987a, 1987b), and their coworkers (Entwistle & Ramsden, 1983; Marton, Hounsell, & Entwistle, 1984), students approach learning situations in several characteristic ways. One of the principal distinctions made is between students who adopt a deep approach versus those adopting a surface approach. Central to this distinction is the degree to which the intention and commitment to learning is characteristic of students. Students who adopt a deep approach regard the text or problem material to be learned as instrumental to understanding the underlying meaning found in the material. These students are characterized by little concern for others' evaluations of their performance, active interest in the learning material, and attempts to evaluate the evidence presented, relating it to other topics in order to draw conclusions. For students who adopt a deep approach, learning is viewed as a process of constructing meaning and understanding the world.

In contrast, students who adopt a surface approach regard the particular learning material as what needs to be learned, and they tend not to link it to a

larger conceptual framework. A surface approach often results when students' performance will be evaluated and they are motivated to satisfy the demands of others. Learning is viewed as emphasizing the transmission of the content of the learning materials into the head of the learner, with a focus on memorization and passive knowledge acquisition to permit reproduction of the material on tests and evaluations.

A third approach, the strategic approach, combines elements of both the deep and surface approaches. Here learners are primarily concerned with impressing their teachers and obtaining positive performance evaluations. Consequently, there is a sensitivity among these students to the assessment demands and a concern for organized studying and efficient time management. Students who adopt a strategic approach tend to conserve their effort when possible, but adopt a deeper approach when this is necessary to obtaining good grades.

A fourth approach, the apathetic approach, characterizes students who are not engaged by the material or interested in its content. These students do not really know why they have to learn the material, put forth minimal effort, and tend not to be too concerned with others' evaluations of their performance. Also relevant to a student's approach to learning and studying is his or her academic self-confidence, so a measure of this is also included in the most recent version (Entwistle & Tait, 1992) of the Approaches to Studying and Learning Inventory.

Action versus State Orientation

According to action control theory Kuhl (1981, 1984, 1990; Kuhl & Beckman, 1985; Kuhl & Kraska, 1989), when an individual perceives that an intended action is difficult to enact, volitional control processes will be used to maintain intended actions and inhibit distractions. Action versus state orientation is both an ability-like and a state-like construct hypothesized to influence the difficulty of enacting an intention.

Action-oriented individuals tend to take immediate action to enact their intentions. They are characterized by having situationally appropriate intentions and an awareness of a means of transforming their current situation into some desired future state. In contrast, state-oriented individuals are marked by intentions that either are unrealistic or should be postponed.

The state-oriented individual is often fixated on "past, present, or future states, for example, on a past failure to attain a goal, on the present emotional consequences of that failure, or on the desired goal state itself" (Kuhl & Kraska, 1989, p. 366).

Mastery versus Performance Orientation

Mastery-oriented students seek challenging tasks and maintain effective striving under failure (Dweck & Leggett, 1988). They pursue learning goals in achievement situations and put forth effort to increase their competence (Nicholls & Dweck, 1979). In contrast, performance-oriented students are characterized by avoidance of challenge and impaired performance in the face of failure (Elliot & Dweck, 1988). They pursue performance goals, seeking to maintain positive judgments of their ability and avoid negative judgments (Nicholls & Dweck, 1979).

Mindfulness

Mindfulness refers to the intentional, purposeful, metacognitively guided employment of non-automatic, hence effort demanding, mental processes (Salomon, 1987). A learner rarely applies knowledge and skill automatically when needed or appropriate. There must be an *intention* to mobilize and apply knowledge and skill to a new situation. This intention mobilization is mentally taxing—it demands *effort investment* in *mindful* application of knowledge and skill. The difference between what a person can do and what a person actually does in a situation indicates the effect of mindful effort investment. The distinction between mindfulness and mindlessness is also parallel to that between controlled and automatic processing.

Method

Participants

A total of 60 students from the California Polytechnic State University, San Luis Obispo, participated in the study. The sample was comprised of 31 males and 29 females, ranging in age from 20 to 25, with a mean age of 22. Participants were administered the measures as part of a speech communications class. This class was required for students from all majors, so it is expected to be representative of this population of students. Admissions policies at California Polytechnic State University are quite selective.

Consequently, this sample is not expected to be representative of the wider population of all 20- to 25-year-olds.

Measures

The measures used in this study were administered by questionnaire in a booklet form. Each measure appeared in its own section in the booklet. Table 1 shows the order of presentation, the number of items per scale, and the approximate administration time for each measure.

Approaches to Learning and Studying

This questionnaire is designed to measure several characteristic ways in which students approach learning situations. It has undergone numerous revisions since its inception (Entwistle 1981, 1987a, 1987b; Entwistle & Ramsden, 1983; Marton & Säljö, 1976; Säljö, 1975), and the most recent revision (Entwistle & Tait, 1992) contains a total of 60 five-choice Likert scale items measuring four approaches to learning—deep (16 items), surface (16 items), strategic (16 items), and apathetic (8 items)—and a brief scale measuring academic self-confidence (4 items). No reliability data are yet available for the scales since this is a very recent revision. Since the questionnaire was developed primarily for U.K. college students, some words in the items were replaced by their more appropriate counterparts to make the items more appropriate for college students in the U.S.

Mindfulness

Mindfulness was assessed by the Amount of Mental Effort Invested (AIME) questionnaire from Salomon's (1981) work. This self-report measure consists of 33 statements describing the application of mindful effort in various situations. Respondents are directed to indicate their agreement or disagreement with each statement on a 5-point Likert scale.

Action versus State Orientation

The Action Control Scale was used to assess action versus state orientation following the research of Kuhl (1981, 1984, 1990; Kuhl & Beckman, 1985; Kuhl & Kraska, 1989). The three scales measured failure-related (20 items, =.72) and decision-related (20 items, =.76) action orientation, and performance-related (20 items, =.52) orientation (Kanfer, Dugdale, & McDonald, in press). Each item specifies a situation followed by an action-

Table 1

Item Format, Number of Items, and Estimated Time Requirements for Each Measure Included in Study 1

Measure/Construct	Format	Items	Time (min.)
Approaches to Studying Inventory	Likert Scale	60 (total)	21-30
Deep Approach	etc.	16	
Intention to understand	etc.	4	
Active interest		4	
Relating ideas		4	
Use of evidence		4	
Surface Approach	etc.	16	
Intention to reproduce	etc.	4	
Passive learning		4	
Unrelated memorizing		4	
Fear of failure		4	
Strategic Approach	etc.	16	
Intention to excel	etc.	4	
Alertness to assessment demands		4	
Study organization		4	
Time management		4	
Apathetic Approach	etc.	8	
Lack of direction	etc.	4	
Lack of interest		4	
Academic Aptitude	etc.	4	
Academic self-confidence	etc.	4	
Action Control Scale (total)	Forced-Choice	60 (total)	21-30
Performance orientation	Forced-Choice	20	7-10
Decision orientation	Forced-Choice	20	7-10
Failure orientation	Forced-Choice	20	7-10
Intellectual Achievement Responsibility	Forced Choice	34	12-17
Mindfulness	Likert + Open-ended	33	12-17

oriented and a state-oriented response, with scores for each scale computed as the number of action-oriented responses selected.

The failure-orientation scale contains items assessing preoccupation with negative experiences. Its label is somewhat misleading because only about half of the items are related to experiences of failure while the remainder describe unpleasant situations that do not involve achievement. The failure-orientation scale measures preoccupation that *is not* confined to achievement settings, and stands in contrast to the worry component of evaluation anxiety which *is* confined to achievement settings. It is sometimes referred to as the preoccupation scale.

The decision-related scale measures difficulty in taking action once a decision has been made. It does not measure the inability to terminate the decision process. Kuhl sometimes refers to this scale as the hesitation scale.

The performance-related scale has undergone serious revision since its inception. It was originally designed under the assumption that success-related thoughts were associated with an action orientation, but was later revised when evidence was found that the state orientation was characterized by persevering thoughts that could be either positive or negative. The revised scale measures the ability to persist at self-initiated and pleasant activities without shifting prematurely to alternative activities. It is sometimes referred to as the volatility scale and can be interpreted as measuring an overfunctioning of the action initiation system. Kuhl reports that it is empirically orthogonal to the other two action control scales.

Kuhl (1984) and Kanfer et al. (in press) report moderate correlations between action-orientation subscale scores and personality variables such as test anxiety, extroversion, self-consciousness, achievement motivation, future orientation, and cognitive complexity. These correlations reflect the theoretically expected overlap and at the same time indicate that a sizable proportion of variance in action-orientation scores cannot be accounted for by these variables.

Mastery versus Performance Orientation

Dweck has explored several methods for determining whether students hold a mastery versus a performance orientation, including a questionnaire

method and several single-item procedures. The questionnaire method was explored here and involves using the Intellectual Achievement Responsibility Scale (IAR; Crandall, Katkovsky, & Crandall, 1965). The IAR is a 34-item attributional scale designed for primary school children and was chosen because past research (Dweck, 1975) showed that the major difference between the mastery and performance orientations was in the respective tendency to neglect or emphasize the role of effort in determining failure. Mastery-oriented students regard effort as the major cause of failure and increase their effort when faced with task difficulty or failure. Performance-oriented students, on the other hand, regard failure as a consequence of inadequate ability and view additional effort as unhelpful. Dweck administers the entire IAR, but uses a subset of 10 items to determine mastery versus performance orientation. These 10 items describe positive and negative achievement outcomes and list two choices. One choice indicates that the outcome was caused by the child's effort, and the other indicates that the outcome was the result of someone or something in the environment. Scores of 7 or less indicate attributions to the environment and a performance orientation. Scores of 8 or more indicate attributions to the child, and a mastery orientation. This was the method used to measure mastery versus performance orientation in this study, except that dichotomous scores were not used in all analyses, and the score out of 10 was used as a measure of mastery orientation.

Procedure

Participants were administered the questionnaire booklets during the speech communication classes and required to turn them in at the end of the class.

Results and Discussion

Frequency histograms for scores from each member were plotted and appeared to be normally distributed, with no floor or ceiling effects. Table 2 displays the corrected correlations among the measures with the Cronbach alpha reliabilities appearing in the diagonal.

Reliability Analyses

The Cronbach alpha reliabilities ranged from .54 to .85. Most of the reliabilities were above .7. The exceptions were the 8-item academic self-

Table 2

Cronbach alpha Reliabilities and Corrected Correlations Among the Measures From Study 1

	Construct	Deep	Surf	Strat	Apath	SelfC	ACP	ACF	ACD	Mast	Mindf
Deep	Deep Approach	(85)									
Surf	Surface Approach	-46	(78)								
Strat	Strategic Approach	72	-53	(73)							
Apath	Apathetic Approach	-31	59	-74	(81)						
SelfC	Academic Self-Confidence	28	-63	48	40	(68)					
ACP	Action Control - Perform.	ns	42	ns	ns	ns	(71)				
ACF	Action Control - Failure	ns	-74	ns	-37	41	-45	(77)			
ACD	Action Control - Decision	37	-51	65	-39	ns	-36	77	(66)		
Mast	Mastery Orientation	ns	ns	ns	ns	ns	ns	ns	ns	(54)	
Mindf	Mindfulness	82	-40	65	-27	ns	ns	ns	35	ns	(73)

Note. Decimals omitted. All correlations have been corrected for unreliability. Cronbach alpha reliabilities appear in parentheses in the diagonal. All correlations shown are significant at .05 or better, all others are marked ns.

confidence scale (r = .68), the 20-item action-orientation decision scale (r = .66) and the mastery-orientation scale (r = .54). Item analyses were conducted on the mastery scale to help understand the low reliability. These analyses revealed that one of the items correlated negatively (-.18) with the remaining items as keyed using Dweck's scoring key. This item was "Suppose a person doesn't think you are very bright or clever. (a) Can you make him change his mind if you try to, or (b) are there some people who will think you're not very bright no matter what you do?" In these data, the effort attribution associated with changing a person's unfavorable opinion of your skills is different from other items measuring mastery orientation. Mastery orientation is conceived of as an adaptive response, and choosing option (b) is probably more adaptive, even though it does not involve an effort attribution. Had this item been removed, the reliability would increase to .65. Two other items had very low item-total correlations (.07 and .12) and could probably be improved on.

Correlational Analyses

The correlations appearing in Table 2 reveal that taking a deep approach to learning by actively interacting with learning material, looking for

meaning, and relating it to one's own life is highly correlated (corrected r = .72) with a strategic approach to studying (intention to excel, alertness to assessment demands, study organization, and time management). A deep approach is also highly correlated (corrected r = .82) with Salomon's (1987) mindfulness construct. A comparison of the items from the deep approach measure to the mindfulness items reveals that both contain items that involve an enjoyment of careful thought and a preference for deliberation and complexity.

Despite these similarities, there are some notable differences between the deep approach and mindfulness measures. All of the items measuring a deep approach are concerned with school-related learning and activities, whereas items from the mindfulness scale tend to be much broader, with no direct reference to school learning, except for using the word "assignment" in the general sense in one item. Some of the items could refer to school-relevant situations, but direct references to this domain do not appear in the mindfulness scale as they do in the deep approach measure. A second difference is that all of the deep approach items are positively keyed, but the mindfulness scale contains both positive and negatively keyed items. Furthermore, the mindfulness scale contains several items measuring frequency of behavior and a few open-ended questions about the questionnaire itself. This results in a slightly different and more complicated response format for the mindfulness scale. Third, the mindfulness scale contains items tapping domains beyond those in the deep approach scale. For example, some of the negatively keyed items refer to impulsivity (e.g., I find myself doing things quite impulsively). Others seem to reflect a disdain for effortful thinking (e.g., Thinking is not my idea of fun), and still others seem associated with reflectivity (e.g., Once I finish an assignment, I move on; I rarely go back and look over it again).

Given these differences between the two measures, the high correlation obtained is striking. Taking into account the methodological differences between the questionnaires, one is inclined to conclude that both questionnaires are very nearly measuring the same construct.

Mastery orientation does not seem to correlate with anything. This is perhaps due to its low reliability, but even an examination of the items reveals

that they appear to be only tenuously held together by the notion that success or failure is attributable to effort.

Principal Components Analyses

Even though principal components analyses are not recommended for a sample of this size, we went ahead anyway to obtain a very rough idea of the dimensionality of the data. We included the subscale scores for the Approaches to Studying Inventory instead of the total scores for the deep, surface, strategic, etc. scales to determine whether the subscales would form associations with other variables. Also included were the three action control scales, the mastery score, and mindfulness. A scree plot indicated that 3-, 4-, 5- and 6-component solutions should be pursued. The 3-, 4-, 5- and 6-component solutions were rotated by varimax, and we will discuss the 6-component solution here. Component 1 was marked by high loadings on the subscales from the deep approach and mindfulness, and was interpreted as measuring a deep, thoughtful approach to learning. Componcnt 2 was defined by state orientation and evaluation anxiety and, to some extent, by low academic self-confidence and unrelated memorizing. The highest loadings for this component were on the scales related to failure (Action Control–Failure and Fear of Failure). Intention to excel, negative lack of direction, negative lack of interest, and academic self-confidence formed Component 3. This component seems to be tapping a confident, ambitious, and enthusiastic approach to learning. Component 4 was defined by high loadings on organized study habits and time management and moderate loadings on use of evidence and decision-related action orientation. Individuals with high scores on this component probably have organized study habits and often take the initiative in coursework. Component 5 had a single high loading for mastery orientation, and Component 6 was marked by moderate to high loadings on alertness to assessment demands, intention to reproduce, and passive learning. This component seems related to a surface approach, but without evaluative anxiety and unrelated memorizing.

Conclusions and Implications for Future Research

Psychometric Properties of Measures

On the whole, the questionnaires demonstrated reasonably good psychometric properties with a few exceptions. The Approaches to Studying Inventory seemed particularly well refined and demonstrated moderate to high reliabilities despite small numbers of items per scale. The action control scales also showed moderate to high reliabilities, but probably could benefit from another round of item analyses, especially for the decision-related action-orientation scale. The mindfulness scale was reliable, but a preliminary examination of the item-level data indicated that some items had low loadings, and one item seemed to be correlated negatively with the others, yet was scored correctly. It would benefit from some revision and further analyses to explore the additional scores that can be generated from the questionnaire (e.g., behavior frequency and nonsense items). The mastery scale showed the lowest reliability, with one item correlating -.20 with the remaining items. This scale needs to be revised more substantially.

Mindfulness versus Deep Approach

Perhaps the most striking finding was the high correlation between mindfulness and the deep approach. This was despite differences in content (school-related versus broad) and questionnaire format. Examination of the mindfulness items (and to some extent the deep approach items) suggested that mindfulness may be multidimensional, with subscales measuring reflectivity versus impulsivity and enjoyment of thinking versus disdain of it. Perhaps these scales would be too highly correlated to separate, but it would be worth looking into. For the next round of data collection, including a measure of reflectivity-impulsivity would be helpful to determine the relationship between this more established personality construct and mindfulness/deep approach.

Item-level Analyses

Future work with larger samples should conduct item-level analyses to revise some of the scales. More data need to be collected to permit item-level component and factor analyses, but these techniques would seem to be particularly helpful because they might show that new scales can be constructed from items across different measures.

Cluster Analyses

An additional data analytic approach that might be worthwhile when more data are available would be to perform a cluster analysis on the participants in the study by a hierarchical method such as Ward's method. This could be used to decide on the number of people-clusters in the data. Subsequently, a nonhierarchical method could be used, such as k-means, to create clusters that are internally homogeneous, but maximally different from one another. Profiles of the mean scores on the conative measures could then be generated for each cluster. Learning and performance tasks could be devised that are designed to distinguish the clusters.

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